# APPENDIX

THIS APPENDIX INCLUDES A COPY OF A PROPOSED AMENDMENT WHICH WAS PROVIDED TO THE EXAMINER PRIOR TO THE INTERVIEW VIA FACSIMILE AND WHICH WAS DISCUSSED DURING THE INTERVIEW. **THE PROPOSED AMENDMENT IS NOT TO BE ENTERED AS A SEPARATE AMENDMENT BUT AS AN APPENDIX TO THE PRESENT AMENDMENT SO THAT THE RECORD RECORDING THE INTERVIEW IS COMPLETE**

*** PROPOSED AMENDMENT ***
*** SUBMITTED FOR DISCUSSION PURPOSES ONLY***

IN THE UNITED STATES
PATENT AND TRADEMARK OFFICE

Attorney Docket No.: **HA-86 (HAL-ID 167)**

Appl. No.: **10/020,703**

Applicants: **John G. N. HENDERSON, Carl SCARPA**

Filed: **November 30, 2001**

Title: **STEERABLE ANTENNA AND RECEIVER INTERFACE FOR TERRESTRIAL BROADCAST**

TC/A.U.: **2821**

Examiner: **Dao L. Phan**

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

**AMENDMENT**

Sir:

In response to the Office Action mailed on October 6, 2004, which set a period for response to expire on January 6, 2004, that period being extended one month to expire on February 6, 2004, please amend the application as follows:

**Amendments to the Claims** are reflected in the listing of claims which begins on page 2 of this paper.

**Remarks/Arguments** begin on page 19 of this paper.

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This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (currently amended): ~~A~~ An antenna apparatus for use with a digital communications channel over which a multi-bit digital control signal is communicated, said antenna apparatus supporting a plurality of antenna pattern positions, different ones of said antenna pattern positions being identified by different predetermined position indicator values, the antenna apparatus comprising:

~~a digital communications channel for receiving a digital control signal including antenna pattern position control information;~~

control circuitry, coupled to the digital communications channel, the control circuitry including a direction control device for receiving said multi-bit digital control signal, said digital control signal including one of said predetermined position indicator values and at least one other control value, and for generating at least one antenna pattern position control signal from said digital control signal and one additional control signal; and

a controllable antenna element assembly having a steerable antenna pattern including a plurality of ~~lobes and at least one null~~ regions including at least a first region having a first gain and a second region having a second gain which is lower than said first gain, the controllable antenna element assembly being responsive to said at least one antenna pattern position control signal.

2. (original): The apparatus of claim 1, wherein said digital communications channel is a serial bus.

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3. (original): The apparatus of claim 1, wherein said communications channel is implemented using a coaxial cable also used to output signals received by said controllable antenna element assembly.

4. (currently amended): ~~The apparatus of claim 1,~~ An antenna apparatus for use with a digital communications channel over which a digital control signal including antenna pattern position control information is communicated, the apparatus comprising:

control circuitry, coupled to the digital communications channel, the control circuitry including a direction control device for generating at least one antenna pattern position control signal from said digital control signal; and

a controllable antenna element assembly having a steerable antenna pattern including a plurality of regions having different gains, the controllable antenna element assembly being responsive to said at least one antenna pattern position control signal;

wherein said digital control signal includes an antenna position portion and a gain control portion, and

wherein the control circuitry includes a gain decoder for generating a gain control signal as a function of the gain control portion of said control signal.

5. (original): The apparatus of claim 4,

wherein said digital control signal further includes a channel number portion, and

wherein the control circuitry further includes channel number processing circuitry for generating a tuning

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voltage as a function of the channel number portion of said digital control signal.

6. (original): The apparatus of claim 5, further comprising a tuning circuit coupled to said antenna element assembly, the tuning circuit being responsive to the tuning voltage.

7. (original): The apparatus of claim 4,

wherein said digital control signal further includes a polarization control portion, and

wherein the control circuitry further includes a polarization control circuit coupled to said antenna element assembly.

8. (original): The apparatus of claim 6, further comprising:

a memory device including antenna capabilities information.

9. (original): The apparatus of claim 8, wherein said controllable antenna element assembly includes:

a plurality of individual antenna elements; and

at least one switch being coupled to each of the individual antenna elements, each switch being coupled to said direction control device.

10. (original): The apparatus of claim 8, wherein said control circuitry includes at least one integrated circuit for performing a decoding operation on at least a portion of said digital control signal.

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11. (original) The antenna apparatus of claim 10, further comprising a coupling device including at least three connections, the first connection for coupling said digital communication channel to a control line of a receiver, the second connection for coupling said controllable antenna element assembly to a signal input of said receiver, and a third connection for coupling the control circuitry to a power supply line of said receiver.

12. (currently amended): A receiver apparatus, comprising:

a tuner for receiving a broadcast signal from an antenna device;

a received broadcast signal processing circuit ~~and~~ for generating at least one signal measurement value from said received broadcast signal;

an antenna controller for generating a digital antenna control signal including at least one of gain information, polarization control information, and channel number information, in addition to antenna pattern position control information, the antenna pattern position control information being determined by said antenna controller as a function of said at least one signal measurement value; and

a communications channel for outputting the digital antenna control signal to said antenna device.

13. (original): The apparatus of claim 12, wherein said received broadcast signal processing circuit is a demodulator and wherein said at least one signal measurement value is a signal to noise estimate.

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14. (original): The apparatus of claim 12, wherein said communications channel is a serial data bus.

15. (original): The apparatus of claim 14, wherein said antenna controller includes:

an antenna control and positioning routine used to generate said digital antenna control signal.

16. (original): The apparatus of claim 15, wherein said antenna control and position routine includes instructions for rotating said antenna pattern through a plurality of positions to select an optimum position based on said at least one measurement value without human input.

17. (original): The apparatus of claim 15, further comprising:

stored antenna information received from an antenna device via said serial data bus.

18. (original): The apparatus of claim 17, further comprising:

stored antenna channel state information specifying settings to be used for a plurality of controllable antenna features for each of a plurality of receiver channel settings.

19. (original): The apparatus of claim 14, further comprising:

a multi-terminal adapter for connecting said apparatus to an antenna device, the multi-terminal adapter including a first terminal for receiving said broadcast signal from the antenna device, a second terminal for

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supplying power to said antenna device; and a third terminal for coupling said serial bus to the antenna device.

20. (original): The apparatus of claim 14, wherein the received broadcast signal processing circuit is a television signal demodulator circuit.

21. (original): A receiver apparatus, comprising:

a tuner for receiving a broadcast signal from an antenna device;

a received broadcast signal processing circuit and for generating at least one signal measurement value from said received broadcast signal;

an antenna controller coupled to said broadcast signal processing circuit for generating digital antenna control signals used to automatically adjust the position of an antenna pattern of said antenna device, the antenna pattern including a plurality of lobes and at least one null so that the null is orientated in the direction of a source of signal interference; and

a communications channel for outputting the digital antenna control signals to said antenna device.

22. (original): The receiver apparatus of claim 21, wherein said antenna controller further comprises:

means for including antenna gain control information in at least some of said digital antenna control signals.

23. (original): The receiver apparatus of claim 22, wherein said antenna controller further comprises:

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means for including channel information in at least some of said digital antenna control signals.

24. (original): The receiver apparatus of claim 22, wherein said antenna controller further comprises:

means for including antenna polarization information in at least some of said digital antenna control signals.

25. (original): A television, comprising:

an antenna device having an electronically steerable antenna pattern, the antenna pattern including at least a front lobe, a rear lobe and at least one null, the antenna device including:

a control circuit for controlling the position of said antenna pattern in response to digital control signals;

a receiver coupled to said antenna device, the receiver including;

a demodulator for demodulating broadcast signals received from said antenna device and for generating at least one signal measurement value; and

antenna control circuitry for generating a plurality of said digital control signals to steer said antenna pattern as a function of said at least one signal measurement value; and

a display device coupled to said demodulator for displaying images generated from said received broadcast signals.

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26. (original): The television of claim 21, further comprising:

a television housing for housing both said antenna device and said receiver.

27. (original): The television of claim 21, further comprising:

a serial data bus for coupling the antenna control circuitry to the antenna device.

28. (original): The television of claim 27, wherein said antenna control circuitry includes means for determining when said antenna pattern position is in a position which produces less signal interference than at least one other antenna pattern position.

29. (currently amended): A multi-bit antenna control signal used for controlling characteristics of an antenna, the control signal comprising:

a first ~~plurality of~~ signal component~~s representing at least two~~ including one of: a direction field including antenna pattern direction control information, a gain field including antenna gain information, a channel number field including a channel number, and a polarization field including antenna polarization information; and

a second signal component, said second signal component including a field which is different from the filed included in said first signal component, said second signal component including one of: a direction field including antenna pattern direction control information, a gain field including antenna gain information, a channel

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number field including a channel number, and a polarization field including antenna polarization information.

30. (currently amended) The multi-bit antenna control signal of claim 29, wherein said first ~~plurality of~~ signal component ~~components~~ includes said direction field, the direction field including at least three bits.

31. (original) The multi-bit antenna control signal of claim 30, wherein the direction field specifies an antenna pattern direction.

32. (currently amended) The multi-bit antenna control signal of claim 30, wherein said ~~plurality~~ second of signal components ~~further~~ includes said gain field, the gain field including at least two bits used to indicate a level of gain to be applied by an amplifier device in said antenna.

33. (currently amended) The multi-bit antenna control signal of claim 30, wherein said first ~~plurality of~~ signal component ~~components further~~ includes said channel number field, the channel number field including at least three bits used to indicate the number of a broadcast channel to be received by said antenna.

34. (currently amended) The multi-bit antenna control signal of claim 30, wherein said ~~plurality of signal components further~~ first signal component includes said polarization field, the polarization field including at least one bit used to specify one of a plurality of possible antenna polarizations.

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35. (original) A method of controlling an antenna, the method comprising the steps of:

generating at least one digital control signal including a direction information field and at least one of a gain information field, channel number field,. and polarization information field; and

transmitting said digital control signal to an antenna.

36. (original) The method of claim 35, wherein the step of generating a digital control signal includes:

measuring a signal characteristic of a broadcast signal received by said antenna.

37. (original) The method of claim 36, wherein the step of generating at least one digital control signal includes:

measuring the signal to noise ratio of said received broadcast signal; and

wherein the method further comprises automatically sending said antenna multiple digital control signals to modify the direction of the antenna pattern of said antenna in an attempt to find a position which results in a satisfactory signal to noise ratio.

38. (original) The method of claim 36, further comprising the step of:

receiving antenna capability information from said antenna.

39. (original) The method of claim 38, wherein the step of transmitting said digital control signal to an antenna

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includes the step of transmitting said digital control signal over a serial bus.

40. (original) The method of claim 39, further comprising the step of:

supplying direct current power to said antenna over a line which is separate from said serial bus.

41. (original) The method of claim 40, wherein said step of measuring a signal characteristic of a broadcast signal received by said antenna includes:

receiving from said antenna the received broadcast signal via a co-axial cable.

Claims 42-53 (Canceled)

~~42. A method of supporting communications in a portable device, the method comprising:~~

~~providing a plurality of antennas, each of said plurality of antennas supporting adjustable antenna pattern positions;~~

~~receiving and decoding a signal using a first one of said plurality of antennas while adjusting the antenna pattern position of a second one of said plurality of antennas during a first period of time; and~~

~~receiving and decoding a signal using the second one of said plurality of antennas while adjusting the antenna pattern position of the first one of said plurality of antennas during a second period of time.~~

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~~43. The method of claim 42, wherein the first and second periods of time are immediately consecutive periods of time.~~

~~44. The method of claim 42, wherein said signal is a broadband communications signal.~~

~~45. The method of claim 42, further comprising, at the end of the first period of time, the step of:~~

~~operating a switching device to disconnect an output of the first antenna to a signal processor and to connect the output of the second antenna to the signal processor.~~

~~46. A system for receiving broadcast signals, comprising:~~

~~a plurality of antennas, each antenna having an antenna pattern with a first region having a first gain and a second region having a second gain lower than said first gain, said second region of each of said plurality of antennas being oriented in a different direction from the second region of at least one other antenna in said plurality of antennas; and~~

~~a receiver coupled to said plurality of antennas, the receiver including a selection device for selecting an antenna signal, output by one of said plurality of antennas, as a function of a signal noise measurement.~~

~~47. The system of claim 46,~~

~~wherein said signal noise measurement is a signal to noise ratio measurement; and~~

~~wherein said receiver further includes:~~

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~~means for generating said signal to noise ratio measurement from the output of an antenna.~~

~~48. The system of claim 47, wherein said selection device selects the antenna output signal with the lowest signal to noise ratio.~~

~~49. The system of claim 46, wherein each of said plurality of antennas has the same physical structure but is mounted in said system with a different physical orientation.~~

~~50. The system of claim 46, wherein at least one of said plurality of antennas has a steerable antenna pattern.~~

~~51. A receiver system, the system comprising:~~

~~an antenna with a steerable antenna pattern, the antenna pattern including a high gain region and a low gain region, the low gain region having a gain which is at least six dB lower then the maximum gain in the high gain region; and~~

~~an antenna pattern position control module for directing the position of said antenna pattern so that the low gain region is positioned in the direction of a source of signal interference.~~

~~52. The receiver system of claim 51,~~

~~wherein said antenna pattern position control module generates digital position control signals; and~~

~~wherein the antenna further comprises:~~

~~an antenna pattern position control signal decoder module for decoding said digital position control signals.~~

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~~53. The receiver system of claim 52, wherein said antenna pattern position control module includes:~~

~~means for determining the signal to noise ratio of a signal received from said antenna; and~~

~~means for generating said digital antenna pattern position control signals to direct said antenna pattern position to a position which maximizes said signal to noise ratio.~~

54. (new) An apparatus, comprising:

an antenna device having an electronically steerable antenna pattern, the antenna pattern including at least first region and a second region, the first region having a higher gain than the second region, the antenna device including:

a control circuit for controlling the position of said antenna pattern in response to a digital control signal;

a receiver coupled to said antenna device, the receiver including:

a demodulator for demodulating broadcast signals received from said antenna device and for generating at least one signal measurement value; and

antenna control circuitry for generating a plurality of said digital control signals to steer said antenna pattern as a function of said at least one signal measurement value; and

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a display device coupled to said demodulator for displaying images generated from said received broadcast signals.

55. (new): The apparatus of claim 54, further comprising:

a housing for housing both said antenna device and said receiver; and

wherein the gain in said first region is at least 6 dB higher than the gain in said second region.

56. (new): The apparatus of claim 54, wherein said digital control signals are multi-bit signals, the apparatus further comprising:

a serial data bus for carrying said multi-bit digital control signals, said serial data bus coupling the antenna control circuitry to the antenna device.

57. (new): The apparatus of claim 54, wherein said antenna control circuitry includes means for determining when said antenna pattern position is in a position which produces less signal interference than at least one other antenna pattern position.

58. (new) The apparatus of claim 54, wherein said digital control signal includes at least two different control information fields, the two different control information fields being from the group of information fields consisting of: a direction field including antenna pattern direction control information, a gain field including antenna gain information, a channel number field including a channel number, and a polarization field including antenna polarization information.

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59. (new) An antenna apparatus for use with a digital communications channel over which a digital control signal including antenna pattern position control information is communicated, the apparatus comprising:

control circuitry, coupled to the digital communications channel, the control circuitry including a direction control device for generating at least one antenna pattern position control signal from said digital control signal; and

a controllable antenna element assembly having a steerable antenna pattern including a plurality of regions having different gains, the controllable antenna element assembly being responsive to said at least one antenna pattern position control signal;

wherein said digital control signal includes an antenna position portion and a channel number portion, and

wherein the control circuitry includes channel number processing circuitry for generating a tuning control signal as a function of the channel number portion of said digital control signal.

60. (new): The apparatus of claim 59,

wherein said apparatus further comprises a tuning circuit coupled to said antenna element assembly, the tuning circuit being responsive to the tuning voltage.

61. (new) An apparatus for use with an antenna device having an electronically steerable antenna pattern, said antenna apparatus supporting a plurality of antenna pattern positions, the apparatus comprising:

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a receiver having an input for coupling to said antenna device, the receiver including:

a demodulator for demodulating broadcast signals received from said antenna device and for generating at least one signal measurement value; and

antenna control circuitry for generating a plurality of multi-bit digital control signals to steer said antenna pattern as a function of said at least one signal measurement value, each multi-bit digital control signal including a predetermined position indicator value indicating one of said plurality of antenna pattern positions to which said antenna device is to be steered and a second value used to provide additional antenna device control information.

62. The apparatus of claim 61, wherein said second value is a polarization control value.

63. The apparatus of claim 61, wherein said second value is a channel number value.

64. The apparatus of claim 61, wherein said second value is a channel number value.

65. The apparatus of claim 1, wherein said other control value is a polarization control value.

66. The apparatus of claim 1, wherein said other control value is a channel number value.

67. The apparatus of claim 1, wherein said other control value is a channel number value.

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68. (New) An antenna apparatus for use with a digital communications channel over which a digital control signal including antenna pattern position control information is communicated, the apparatus comprising:

control circuitry, coupled to the digital communications channel, the control circuitry including a direction control device for generating at least one antenna pattern position control signal from said digital control signal; and

a controllable antenna element assembly having a steerable antenna pattern including a plurality of regions having different gains, the controllable antenna element assembly being responsive to said at least one antenna pattern position control signal;

wherein said digital control signal includes an antenna position control portion and a gain control portion, and

wherein the control circuitry includes a polarization decoder for generating a polarization control signal as a function of the polarization control portion of said control signal.

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REMARKS/ARGUMENTS

I. Introduction

Claims 42-53 have been canceled in view of the fact that they were previously withdrawn from consideration as the result of a restriction requirement. New claims 54-68 have been added. Accordingly, claims 1-41 and 54-68 are now pending.

In the Office Action the Examiner allowed claims 25-28. **Applicants thank the Examiner for this indication of allowable subject matter.**

In the Office Action the Examiner rejected claims 12-24 and 29-34 under 35 U.S.C. §112, second paragraph for various minor wording issues relating to claims 12 and 29. In addition, the Examiner rejected claims 1-24 and 21-41 in view of various references for the reasons set forth in the Office Action.

Applicants thank the Examiner for the opportunity to discuss the Office Action and prior art during the Feb. 24, 2004 interview.

In view of the above amendment and the following remarks, it is respectfully submitted that the outstanding rejections have been overcome.

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II. **The 35 U.S.C. §112, Second Paragraph Rejections Have Been Overcome**

In the Office Action the Examiner rejected claims 12-24 and 29-34 under 35 U.S.C. §112, second paragraph.

**2. Claims 12-24**

With regard to claim 12, the Examiner states:

> As to claim 12, line 3, and claim 21, line 3 "a received broadcast signal processing circuit and for generating" is unclear. (Office Action page 2)

Applicants have amended claims 12 and 21 to delete "and" from the quoted claim element so that the claim language now reads "a received broadcast signal processing circuit for generating". It is respectfully submitted that, as amended, claims 12 and 21, and claims 13-20 and 22-24 which depend there from are now definite.

**3. Claims 29-34**

In the Office Action the Examiner rejected claim 29 stating:

> As to claim 29, lines 3-4, "a plurality of signal components … including antenna polarization information" is indefinite because this is read as a single means claim. (Office Action page 2)

Applicants believe that claim 29 should not have been interpreted as a single means claim but have amended claim 29 to make it clear that the recited signal includes at least a first component and a second

component. As amended claim 29 now recites: Given that the claim now clearly

> A multi-bit antenna control signal used for controlling characteristics of an antenna, the control signal comprising:
>
> a first signal component including one of: a direction field including antenna pattern direction control information, a gain field including antenna gain information, a channel number field including a channel number, and a polarization field including antenna polarization information; and
>
> a second signal component, said second signal component including a field which is different from the filed included in said first signal component, said second signal component including one of: a direction field including antenna pattern direction control information, a gain field including antenna gain information, a channel number field including a channel number, and a polarization field including antenna polarization information.

In view of the above amendment to claim 29, it is respectfully submitted that the "single means" rejection of claim 29 has been overcome. Accordingly, claim 29 and claims 30-34 which depend there from are definite.

## III. The Outstanding Anticipation and/Or Obviousness Rejections Have Been Overcome

In view of the above amendments, Applicant's arguments which follow, it is respectfully submitted that the rejections made in the Office Action should be withdrawn.

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Applicants will now address and highlight the reasons each of the various pending claims is patentable over the applied references.

## 1. Claim 1-11 Are Patentable

In the Office Action, the Examiner rejected claims 1-11 as being anticipated by U.S. Patent No. 3,842,417 to Williams, or U.S. Patent No. 4,045,800 to Tang et al. or U.S. Patent No. 5,701,583 to Harbin et al. None of these references anticipate or render obvious amended claim 1 or amended claim 4 which has been rewritten in independent form.

### A. Claims 1-3

Claim 1 has been amended to recite:

> A antenna apparatus for use with a digital communications channel over which **a multi-bit digital control signal is communicated, said antenna apparatus supporting a plurality of antenna pattern positions, different ones of said antenna pattern positions being identified by different predetermined position indicator values**, the antenna apparatus comprising:
>
> control circuitry, coupled to the digital communications channel, the control circuitry including a direction control device for **receiving said multi-bit digital control signal, said digital control signal including one of said predetermined position indicator values, and for generating at least one antenna pattern position control signal from said digital control signal**; and
>
> a controllable antenna element assembly having a steerable antenna pattern including a plurality of regions including at least a first region having a first gain and a second region having a second gain

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> which is lower than said first gain, the controllable antenna element assembly being responsive to said at least one antenna pattern position control signal.

**i) Williams et al.**

The Williams et al. patent cited by the Examiner does not anticipate or render obvious claim 1. In rejecting claim 1 based on the Williams et al. patent the Examiner cites element 28, the scan control described at col. 4, lines 8-31 as corresponding to control circuitry recited in claim. The input to the "scan control 28" of Williams et al. are "synchronization or master clock pulses". **These signals in the applied reference are NOT multi-bit digital control signals that include a predetermined position indicator value as required by claim 1, and do not render obvious the use of such multi-bit signals or control circuitry of the type recited in claim 1 which processes such a signal.** Accordingly the Williams et al. patent does not anticipate or render obvious any of claims 1-11.

**ii) Tang et al.**

In the Office Action, with regard to claims 1-11, the Examiner states:

> Tang et al teach an antenna apparatus including a digital communications channel for receiving (fig. 1), control circuitry 44, coupled to the digital communications channel, the control circuitry including a direction control device for generating, a controllable antenna element assembly having a steerable antenna pattern (fig. 2, and 8).

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A review of the Tang et al. patent reveals that, in Tang et al., the input to subarray direction control apparatus 44 is a voltage, i.e., an Analog signal, that is generated by beam direction control driver 42 see col., 3, lines 44-51. Accordingly, the Tang et al. patent fails to teach, disclose or suggest **a multi-bit digital control signal including a predetermined position indicator value as required by claim 1.** Thus, claim 1 is clearly patentable over the Tang et al. patents as are the claims which depend from claim 1.

**ii) Harbin et al.**

In the Office Action the Examiner states:

> Harbin et al teach an antenna apparatus including a digital communications channel for receiving 28, control circuitry 34, coupled to the digital communications channel, the control circuitry including a direction control device for generating, a controllable antenna element assembly having a steerable antenna pattern (65; fig. 6)

The Harbin patent briefly describes a data processing device 32 and a scanning array control 34 but fails to provide any detailed discussion of the control signals use. Accordingly, **the Harbin patent, like the other applied references, fails to describe a multi-bit digital control signal that includes both a predetermined position indicator value and at least one other control value as required by claim 1.**

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**Thus, the reference does not render obvious the use of such a multi-bit control signal or control circuitry of the type recited in claim 1.**

B. Claims 4-11

The Examiner failed to specifically address the various dependent claims in the original rejection. Claims 4 and 5-11 which depend there from are patentable because none of the references applied against claims 1-11 teach, disclose or suggest a digital control signal that includes both "**an antenna position portion and a gain control portion**".

Accordingly, claims 4-11 are patentable over the applied references.

## 2. Claims 12-20 Are Patentable

### A. The Rejection Based on Henderson or Ma et al.

The Examiner fails to identify precisely which signal in the applied references the Examiner asserts corresponds to "a digital antenna control signal" recited in claim 12. Applicants have been unable to identify any particular signal in the applied references which satisfies the requirements of the recited "digital antenna control signal".

The antenna controller recited in claim 12 is for generating **a digital antenna control signal that includes**

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**at least two elements: one of A) *gain information, B) polarization control information, and C) channel number information AND antenna pattern position control information.***

Claims 12-20 are patentable over the applied references because the **Henderson patent** and **Ma et al.** patent do not teach, disclose or suggest "**an antenna controller for generating a digital antenna control signal *including at least one of gain information, polarization control information, and channel number information, in addition to antenna pattern position control information*"** as recited in independent claim 12. Thus, claim 12 and claims 13-20 which depend there from, either directly or indirectly, are patentable over the applied references.

**B. The Rejection Based on Ikeda et al.**

Claims 12-20 stand rejected as being anticipated by Ikeda et al. (US 2001/0055948).

Claims 12-20 are patentable over the Ikeda et al. application, like the Henderson and Ma et al. patents, does not teach, disclose or suggest "**an antenna controller for generating a digital antenna control signal *including at least one of gain information, polarization control information, and channel number information, in addition to antenna pattern position control information*"** as recited in independent claim 12.

The Examiner's rejection merely states:

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> Ikeda et al teach a receiver apparatus including a tuner 2 for receiving a broadcast signal, a received broadcast signal processing circuit 5 for generating at least one signal measurement value, an antenna controller (fig. 1, Control Portion) for generating a digital antenna control signal, and a communications channel (fig. 1) for outputting the digital antenna control signal. (Office Action page 4)

The Ikeda et al. application describes a system where the directivity pattern of an antenna array is controlled by an antenna control signal sent to phase shifters (PHS-1 through PHS-4). See page 3, paragraph [0039] and Fig. 1. This antenna control position which is used to control antenna directivity is generated by a control portion shown in Fig. 1. The system described in the Ikeda et al. application includes a demodulator portion, DEM Portion 3, that generates an automatic gain control signal (AGC) which is separate from the antenna control signal generated by the control portion and which is communicated over separate lines from the antenna control signal.

While arguably, the Ikeada et al. application describes an antenna position control signal and another separate signal used for gain control by teaching completely separate signals, the Ikeada et al. patent not only fails to teach, disclose or suggest an antenna controller that **a digital antenna control signal *including at least one of gain information ... in addition to antenna pattern position control information*** but

actually teaches away from such a digital antenna control signal.

In view of the above discussion, claim 12 and claims 13-20 which depend there from, either directly or indirectly, are patentable over the Ikeda et al. application.

### 3. Claims 21-24 Are Patentable

In the Office Action the Examiner rejected claims 21-24 as being anticipated by U.S. Patent No. 4,906,506 to Verma et al. stating:

> Verma et al teach a receive apparatus including a tuner (col 2, lines 19-24) for receiving a broadcast signal, a received broadcast signal processing circuit (fig 2) for generating at least one signal measurement value, an antenna controller (15, col. 1 lines 41-51; col 2, lines 24-31) coupled to the broadcast signal processing circuit for generating a digital antenna control signals, and a communications channel (fig. 2) for outputting the digital antenna control signal. (Office Action page 4)

A review of the Verma et al. patent reveals nothing that would anticipate or render obvious the subject matter claimed in claims 21-24.

Claim 21 recites:

> A receiver apparatus, comprising:
> a tuner for receiving a broadcast signal from an antenna device;
> a received broadcast signal processing circuit and **for generating at least one signal measurement value from said received broadcast signal;**

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**an antenna controller coupled to said broadcast signal processing circuit for generating digital antenna control signals** used to automatically adjust the position of an antenna pattern of said antenna device, the antenna pattern including a plurality of lobes and at least one null so that the null is orientated in the direction of a source of signal interference; and

a communications channel for outputting the digital antenna control signals to said antenna device.

In the Verma et al. patent, a mechanical switch 15 is operated by a user to mechanically select by **manually** rotating the switch between three different antenna selections for each of UHF and VHF signal reception. (See Fig. 1 showing system with knob for switch 15 and also see Fig. 2 which shows the switch 15 in further detail.)

The is no automatic adjustment of the position of the antenna pattern in the Verma et al. patent (the position is controlled manually by the user). Accordingly, there are **no digital antenna control signals** used to automatically adjust the position of an antenna pattern, and there is no **an antenna controller of the type recited in claim 21 which generates digital antenna control signals** used to automatically adjust the position of an antenna pattern of said antenna device.

In view of the above discussion, and the **manual mechanical** antenna control system described in the Verma et al. patent, it is respectfully submitted that claim 21 and claims 22-24 which depend there from are neither anticipated nor rendered obvious by the Verma et al. patent.

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4. Claims 25-28 Are Patentable

Claims 25-28 Stand Allowed.

5. Claims 29-41 Are Patentable

Claim 29 as originally written, and as amended in response to the 35 U.S.C. §112, second paragraph rejection, requires **a first signal component and a second signal component which is different from the first signal component**. Each of the two signal components includes an information field from the various types of information fields recited in the particular claim element. **Thus, claim 29 is directed to a multi-bit antenna control signal including at least two different fields where the two different fields are in the set of fields which includes: an a direction field including antenna pattern direction control information, a gain field including antenna gain information, a channel number field including a channel number, and a polarization field including antenna polarization information.** Such a control signal is not taught, suggested or disclosed in the applied reference.

Claims 29-41 stand rejected under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,486,832 to Abramov et al. In rejecting claims 29-41, the Examiner states:

> Abramov et al teach a multi-bit antenna control signal and a method of controlling an antenna including generating (32; fig 4) at least one digital control signal, and

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transmitting (col 1, lines 60+) the digital control signal to an antenna. (Office Action page 4)

A review of the Abramov et al. patent reveals a system in which an antenna can be controlled to move to scan both in azimuth and elevation (See, col. 1, lines 60-67 and col. 2, lines 60-65). This control is achieved through the use of motor control signals generated by an antenna control unit 30 that are used to control a stepper motor 14. (See Fig. 3)

The Abramov et al. patent **clearly lacks the second different information field** which must be one of the types recited in claim 29.

Accordingly, claim 29 and claims 30-34 which depend there from are not anticipated or rendered obvious by the Abramov et al. patent. In addition, claims 35-41 are allowable over the Abramov et al. patent for the same general reasons claims 29-34 are patentable over this reference.

**5. New Claims 54-58 Are Patentable**

New claims 54-58 are believed to be allowable for the same general reasons that claims 25-28 were found to be allowable.

**6. New Claims 59-68 Are Patentable**

New claims 59-62 are directed to subject matter which is believed to be patentable since the prior art,

alone or in combination, does not teach disclose or suggest the novel combination of claimed elements including the various digital control signals, which in many cases include multiple portions which provide different types of control information.

## IV. Conclusion

In view of the foregoing amendments and remarks, the applicants respectfully submit that the pending claims are in condition for allowance. Accordingly, the applicants request that the Examiner pass this application to issue.

**Applicants request that the Examiner contact Applicants' undersigned representative by phone if any outstanding issues remain to be resolved to place the application in condition for allowance.**

Respectfully submitted,

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